Validation of the European Prototype for integrated care at Municipal level in Savona: updating and maintenance.

M. Giacomini[a], I. Peragallo[a], S. Bertone[b], C. Ruggiero[a]

[a]Dip. of Informatics System and Telematics - University of Genova - Via Opera Pia 13 16145 Genova Italy
(giacomin@dist.unige.it)
[b]R.I.L.A.B. s.r.l. - Via Guerrazzi 24 - 16146 Genova Italy

Abstract:
A European Prototype for Integrated Care (EPIC) was set up in the early nineties within one of the programmes sponsored by the European Commission.The system mainly consists of a shared care database in which each groups of facilities is supported by a local area network (LAN).Each LAN is connected over a wide area network to a central node.The system can manage telemedicine tools, such as telealarm and telecardiology equipment.
One of the validation site of EPIC was established in Savona (Italy).Subsequently, the system in Savona has gone through successful validation and increasing integration with the region's health and social care system. Maintenance and updating criteria of the system for a routine use are described.

I Introduction

The EPIC project
The European Commision has supported for many years the development of a common European approach to Health Care Informatics and Telecommunications.Tools, techniques and practises have been developed in Europe with its support, aiming to achieve their acceptance in the community and market.
Several aspects relating to an integrated health care in Europe, such as providing the basis for standard, getting resuls exploited commercially, enhancing user friendliness and accessibility, have been present in the different subsequent frameworks by the Commission, under which collaborative research project involving partecipants from several European Countries are funded.One of the specific applications is the improvement of technology and services for the elderly.
Within the third framework of the European Commission, in the early nineties, a project was sponsored aiming to setting up a European prototype for integrated care (EPIC project, Advanced Informatics in Medicine programme, III framework).
The chief aim of the EPIC project was to improve the quality of community care provided to vulnerable people through the development of an information system for integrated care, which supports the sharing of information between health and social care professionals. Whilst EPIC has been designed as a general community information system, its initial applications focus on the elderly.
The central functions of health and social care professionals are the assessment of individual patients or clients, the identification of their problems and needs, and the planning, delivery and evaluation of care. The approach adopted in EPIC enables the design of a common, client centred system supporting an integrated health care record. The structure of this social/health care record is the core of the whole system and gives the constraints to the development of all applications within EPIC system..These criteria have been incorporated into the EPIC assessment system (EASY). The main activities of the EPIC system have been evaluated during the real-life activities of the social and health care in four validation sites, which actively participated to the project development. The validation sites were: Belfast in Northern Ireland, Turku in Finland, Torre del Mar in Andalusia (Spain), and Savona in Liguria (Italy). One key point of the EPIC project was a standardisation effort at European level, to support information sharing for more effective care providing a standardised basis for a management system based on client needs for planning and man power control
The main component of EPIC is the shared care database in which each community facility, or group of facilities, is supported by a local area network (LAN). Each of these LANs is connected over a wide area network to a central node, enabling updating of and access to information among the various service points. The EPIC system has been implemented according to an open, client-server model where the client health record is managed in an object oriented manner through specified API functions. The software is layered, so that the client application is not affected by how the servers are implemented or which database system they use. Naturally, in any system designed to facilitate the sharing of information, there are important concerns regarding confidentiality and access control mechanisms. The EPIC system meets the confidentiality needs of the client, who should be allowed the choice of who will be granted access to his/her data, and the participating agencies, conforming to their policies on the sharing of client information. The appropriate confidentiality controls are defined locally in EPIC and community care professionals can grant and revoke access to data that they 'own'.

The validation site in Savona
Italy is divided into regions which develop local plans to carry out Government guidelines. Each region is divided into Local Health Districts, each of which provides primary, secondary and tertiary health care. Local Health Districts use both public structures and private structures by specific arrangements. On average a Local Health District provides health care for a population of about 100,000 people.
The Local Health District to which Savona belongs has a population of 130,000, one main Hospital with about 700

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Abstract

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beds and about 30 service points scattered in the District. Geographically the Local Health District of Savona is divided into an area of high population density along the coast and another part with fairly steep hills with small villages where many young and middle aged people live, a high proportion of whom are commuters.Savona - a town with a population of 67,000 - is in Liguria Region, which has a population of 1,715,000 with 22% of the population over 65 and a birth rate of 0.64%, so Liguria is one of the regions with the highest percentage of elderly people in Europe..

Social care in Liguria is normally carried out separately from health care, by special offices in the Municipalities. One of the main areas to which the social interventions are directed is the elderly people.

EPIC dissemination in Savona

The EPIC project seemed particularly suitable to solve the information problems, which is the main problem which ADI had to face. Specifically, the functional and data models studied in EPIC offered good solutions to the problems of the definition of the different operators functionalities and relations, and of the integration of the social and health care competencies, a very important problem of the Italian social/health care assistance models. Besides, the EASY package and the EPIC system on the whole showed the ability to optimise the collection, elaboration and access of the patient clinic/social data in the integrated home-care assistance; the analysis of the telemedicine technology which can best be embedded in this integrated system was also another matter of interest of EPIC. That is why Savona health/social authorities were very interested in the solutions, studied at European level, that the EPIC project could offer in this respect.

The Town Council and the Health Care District of Savona agreed with the Department of Communication, Computer and System Sciences of Genoa University (DIST), that DIST would provide support for the exploitation of EPIC in Savona with reference to telematics and informatics aspects in close collaboration with the staff of the Town Council and of the Health Care District. DIST would also provide personnel training courses.

The EPIC prototype is being used in Savona to assist elderly people in their home both in normal everyday life and in the phase following dismissal from hospitals. The latter case has been given special consideration in Savona since 1992.The use of EPIC will offering satisfactory solutions to several problems, mainly relating to collection, processing and access to patient clinical-social data of the population to be assisted, and relating to the definition of the responsibilities of health and social operators.

With reference to telemedicine tools, the EPIC system can manage telealarm and telecardiology equipment. A special additional feature is the management of devices for the measurement of the lung ventilatory function at patient's home.

Recently some legal decisions carried out by regional and national authorities affected both the way in which social care is offered to the public and the information structure which bases the care offer; obviously these legal decisions affects the use of EPIC in the validation site.

The present paper will give a general overview of the EPIC implementation in Savona and will focus on the necessary changes to make EPIC in complete agreement with the new legal requirements.

II. METHODS

Overview of the shared database in Savona:

The EPIC shared care database mainly consists of two parts: the overall information data base and the assessment software.

In order to integrate all available relevant information about the elderly into a general framework, the EPIC project developed and validated a general data base [1, 2] This database mainly contains two types of data: measurements or assessment of certain well-defined and constant aspects of an elderly person at certain time (such as, for example, the retirement classification and the housing conditions, for the social part of the data base, and the chronicle pathological conditions for the health part of the data-base); measurements or facts concerning well-defined but variable aspects of a patient at certain time (such as, for example, housing expenses for the social part of the data-base and acute pathological conditions for the health part of the data-base). This data base has been developed considering different levels of use for different levels of users, by means of filters on the information to be displayed. Moreover, in the data base nothing is ever deleted or updated. Instead of deleting or archiving data, the data is just marked as deleted or archived in ad hoc fields. Also, the data is updated by just adding a more recent version of the data with the corrections to better reflect the current situation of the elderly at any time. In this way, the whole history of the elderly person is always available.

For the assessment of elderly people EPIC produced the EASY protocol [3]. EASY is an assessment system that has been devised as a rapid assessment of disability, social status and well-being in an elderly person. It has been designed as a first stage assessment for use by different professionals who may use additional specific and in depth assessment procedures as required by the specific application. EASY has been designed to cover the following domains: perceived health, social contacts, economic status and housing, sight, hearing, chewing, disability, well-being, cognitive function, mood, behaviour and carer stress. In addition, EASY includes a structured approach to goal setting and goal attainment. EASY may be given to the elderly person to fill up, or the information may be obtained by interview. If the elderly person is unable to communicate, all questions may be completed by the assessor from their knowledge of the person or by interviewing someone who knows the person well. EASY has been integrated into a computer based environment with the general EPIC data base in order to minimise patient interviews by using all collected information both for assessment and for management purposes.

Regional observatory for social affairs

Recently the regional authority for social care has decided to set-up a computer based regional observatory for social

affairs. A minimal database has been distributed to all social unit in Liguria and its compilation has been made compulsory for all kind of social carers.
This regional decision helps data collection for EPIC (whose validation was previously performed on a voluntary basis), but also requires the development of an interface between the two databases in order to avoid duplication in data insertion.
The observatory database is a relational DB implemented in MsAccess97. As the software platform is the same as EPIC DB, the implementation of its interface is quite simple.
The observatory DB is structured in several tables, partly refer to individual features and partly refer to organization of care deliver. Our interface will affect the individual feature part which contains three main tables:

- individual anagraphical data
- intervents
- contacts

The first one contains data specific of the user and of his/her family and relatives. These data can be directly downloaded into EPIC database only with two main filter procedures:

- to control person duplication with people already present in the EPIC DB, these procedure will be based on the fiscal identification number which is the legal univocal identification number in Italy. If the person is already present in EPIC DB, his/her data will be checked with the ones present in observatory DB, missing data will be downloaded and contradictory data will be presented to the operator
- to change data format in according to field definition in the two databases.

The "Intervents" and "Contacts" tables contain information about what is collected in the "Activity" and "Intervent" tables of the EPIC DB. They relate to an activity which is performed on the user and is subdivided into various contacts. The information on the related subject in the EPIC DB is richer (above for financial details). The downloaded data will constitute a minimal data source for the recording of the activities on the users, but operators will give more details when requested during the download operations.

New rules for social care deliver
During 1999 and 2000 three national acts [4, 5, 6] have changed the rules for access to social care. Old acts fixed national thresholds for all kind of social intervents, the new ones, in aggrement with European directives, apply the concpet of subsidiariety. With this concept the national authority olny gives a general framework with guidelines which have to be applied by local social service providers. They become responsible of enacting rules for service access compatible both with general framework and with local specific conditions.
Service access is limited not only by yearly income, but by the aggregate financial condition of the whole family. For all family members, it considers:

- as positive addends
  - yearly earned income,
  - capital gain,
  - income from real estate
- as negative addends
  - yearly rent (with a maximium threshold) or alternatively the value of property house (with the same maximum threshold)

The total amount will be divided by a coefficient obtained by the sum of some specific parameters corresponding to several family conditions:

- number of components (this number is translated into a coefficient which increases its value with the increase of this number)
- number of handicapped family components
- presence of underage children (this parameter is greater if both parents work)
- absence of one parent

An update of EPIC implementation in Savona will include a form for the calculation of these parameters and for the comparison of the results with the thresholds defined by Savona Town council.

III. RESULTS

System setup
The system is installed both in the Municipality and in the Health district. Both organizations collect data from the clients during normal services and this data, preserving the confidentiality aspects, is transmitted via modem to DIST, which provides data saving and statistical evaluations.
A client can contact either the health care or the social care organization, this organization visits the client for assessment purposes, the assessment procedure evaluates (with the automatic EASY tool) both social and health needs; if the needs relating to the organization which has performed the evaluation overcome a predefined threshold the client is inserted in its care list; if the needs relating to the other organization also overcome its threshold, a message is sent to the data-base management system of the other organization in order to insert the client in its care list. This allows to perform the assessment only once per client, irrespective of which organization has been selected.
During care, the care workers bring a portable personal computer with them, on which a restricted part of the EPIC system is present where they record every information about the interventions. This information is then stored in the centre data-base, where all economical information is calculated.
The Savona prototype for integrated care, involves three operating units: the Bioengineering and Medical Informatics Group of the Dept. of Informatics, Systems and Telematics of the Genova University, the Health Care Centre (USL2) and the Social Care Centre of Savona Municipality.
In the USL2 and in the Social Care Centre a five layered structure is implemented, consisting of:

- a communication layer, which in this prototype is simply implemented by a ISDN based communication, which allows data retrieval from the Medical Informatics centre and mailining facilities between the all three centres

- a database layer, which consists of the personal data of elderly people living in Savona; this layer has been implemented using Access
- an assessment layer, which consists of an electronic format of the EASY assessment which has been set up in EPIC, and which produces an assessment by consulting the data of the client.
- a Visual Basic interface
- a data collection layer which consists of the database level and of the interface level which allow the data collection on a personal notebook whose information can be transferred in the system

System validation

The assessment part of the system has already been validated to a good extent. The Savona Health District has so far carried out the assessment with EASY on 159 elderly persons who are being assisted within the ADI program. The Social Services of Savona Municipality have so far carried out the assessment with EASY on 35 elderly persons.

All interviewers found that the elderly people approached were willing to co-operate, but in some cases there was a certain amount of suspiciousness, specially with self-sufficient elderly people with good quality housing, living with relatives who could take care of them and in good financial conditions. The questionnaire was received with high interest by elderly people living alone, not completely self-sufficient, with poor housing, in poor financial conditions.

The questionnaire appears very suitable for people in good health, self sufficient or almost self-sufficient. It appears inadequate for elderly people who are dement or definitely not self-sufficient. It is felt that the adequacy of the questionnaire is in inverse proportion to the self-sufficiency degree. EASY could be a valid tool for mass screening of people over 65 for an epidemiological assessment, both transverse and longitudinal.

IV. CONCLUSIONS

The main feature of the EPIC is a client centred approach. Since most care provision processes are the same in different countries for different professionals, this approach has allowed to develop a system with several common aspects in different countries. The specific implementations in the sites of the project achieved a balance between common features and specific local needs. The system set up in Savona offers a successful example of the achievements and foreseeable developments of the EPIC project.

EPIC effectively solves the definition of the different operator responsibilities and relations in its data models and functional diagrams. The general system data model of EPIC has been modified for the application in Savona obtaining a simplified version which excludes aspects not applicable for the Italian health and social system. This has allowed to speedy up the use of EPIC in Savona.

EASY has provided an effective tool for defining the requirements of the patient population, and the integration of EASY in the EPIC software system has provided the managers of the care organizations with a facility which guarantees an objective ground for the evaluation of the patient needs and for the management of their access to homecare. However, EPIC is not a “magic” solver for the problems of the integration of health and social assistance. For instance, the lack of personnel, the poor economical situation of the Liguria region and the unstable political situation (during the course of the dissemination, the members of the Town Council boards have changed twice and the level of interest for integrated care in the Savona Municipality and in the Savona Health Care District changed several times during the dissemination of EPIC), are problems which are too complex and local to be addressed at Euopean level in a project, and they were not obviously faced by EPIC.

The aspects of EPIC which were particularly appreciated in Savona were: the computer calculation of the expences and of the cost sharing between social care and health care and the direct provision of documents required by Liguria region, including epidemiological and statistical assessments.

The disseminaiton of EPIC in Savona has received a good level of acceptance mainly by the local health care unit. This is probably due to the fact that in the local health care unit the validation was carried out in collaboration with one medical doctor directly involved in communitiy care, whereas in the town council the staff involved was technical, not directly interacting with the persons receiving assistance.

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